UNITED
NATIONS

E

Economic and Social Council

Distr.
GENERAL

E/CN.17/1994/7
21 April 1994

ORIGINAL: ENGLISH

COMMISSION ON SUSTAINABLE DEVELOPMENT
Second session
16-27 May 1994
Item 6 (b) of the provisional agenda*

REVIEW OF SECTORAL CLUSTERS, FIRST PHASE: TOXIC CHEMICALS AND HAZARDOUS WASTES

Hazardous wastes

Report of the Secretary-General

CONTENTS

	Paragraphs	Page
INTRODUCTION	1 - 2	3
I. GENERAL OVERVIEW	3 - 16	3
II. REVIEW OF THE PROGRESS ACHIEVED IN PROGRAMME AREAS OF CHAPTER 20 OF AGENDA 21	17 - 79	5
A. International cooperation	17 - 50	5
1. Programme area A: promoting the prevention and minimization of hazardous waste	20 - 33	6
2. Programme area B: promoting and strengthening institutional capacities in hazardous waste management	34 - 41	11
3. Programme area C: promoting and strengthening international cooperation in the management of transboundary movements of hazardous wastes	42 - 47	13

* E/CN.17/1994/1.

CONTENTS (continued)

	Paragraphs	Page
4. Programme area D: preventing illegal international traffic in hazardous wastes	48 - 50	14
B. Some country experiences	51 - 62	15
C. Technology and finance	63 - 79	18
1. Technology	63 - 69	18
2. Finance	70 - 79	21
III. CONCLUSIONS AND PROPOSALS FOR ACTION	80 - 93	23
A. Conclusions	80 - 89	23
B. Proposals for action	90 - 93	25

BOXES

1. United Nations publications relevant to hazardous wastes 8

2. Main meetings or workshops held by United Nations organizations since the United Nations Conference on Environment and Development . 9

3. Three examples of economic benefits from cleaner production 10

4. One new way to clean up hazardous wastes 19

5. A successful partnership 20

6. Funding through and of the secretariat of the Basel Convention (SBC) 23

INTRODUCTION

1. In its decision 1993/314 of 29 July 1993, the Economic and Social Council approved the provisional agenda for the second session of the Commission on Sustainable Development which in its item 6 provided for a review of sectoral clusters, first phase, including toxic chemicals and hazardous wastes (item 6 (b)).

2. The Secretary-General was requested, by the Commission at its first session, to prepare thematic reports, such as the present one, corresponding to the sectoral clusters of Agenda 21 1/ to be included on the agendas of forthcoming sessions of the Commission. The Commission requested that the Secretary-General include in such thematic reports information, inter alia, on the main activities that countries were undertaking or planning. 2/ In order to give the United Nations Secretariat sufficient time for the analysis of information received, the Commission encouraged Governments to submit their information not less than six months prior to the Commission's sessions. 3/ Unfortunately the Secretariat had received only a few national reports at the time of the preparation of this report. The report was therefore based mostly on available information within the United Nations system.

I. GENERAL OVERVIEW

3. Economic growth is accompanied by the production of wastes which are often hazardous to health and the environment. Generation of wastes occurs at all stages of production, transportation, transformation, distribution and consumption of goods and services. Responsibility for their disposal is often unclear. Their direct and indirect costs are not reflected in competitive prices set by free markets. Such costs are often borne by society in general at the local, national and international levels unless legislation based on the "polluter pays" principle provides otherwise.

4. Widespread attention to the problem of wastes has increased considerably in the developed countries at first especially with regard to industrial wastes. More recently concerns have also focused on hazardous wastes from agriculture, households and hospitals and a variety of service industries.

5. The adverse health and environmental impacts of hazardous wastes have led to a variety of conflicts between wastes generators and local communities. Such conflicts have extended to distant communities when the transport and disposal of hazardous wastes have involved dumping sites far away from their source. Similarly, transboundary movements have given rise to international conflicts.

6. Because of disparities in power structures within and among nation States, there is an inherent tendency to transfer the burden of hazardous wastes disposal from the rich to the poor either legally through agreements and payments of fees or illegally. That tendency is further strengthened by the magnitude of the costs of the treatment and/or disposal of hazardous wastes at their source and by the absence and/or prohibition of any disposal sites.

7. Many dump sites of hazardous wastes in the developed countries have been identified. They are now also being increasingly identified in developing countries and countries in transition. Their adverse impacts on health and the environment, involving soil and water contamination, have been established. Despite considerable technological progress of clean-up technologies, overall costs are invariably described as enormous.

8. The above pertains to the civilian sectors of national economies. In recent years political developments associated with the end of the cold war and widespread openness have revealed massive problems with military establishments both in the developed countries, and in those of Central and Eastern Europe, as well as in the successor States of the former Union of Soviet Socialist Republics, especially with regard to biochemical, radioactive and hazardous wastes.

9. Despite the magnitude of the problem of hazardous wastes, only a limited number of countries have adopted appropriate legislation and regulations. Where such measures have been adopted, their effective implementation has not been altogether satisfactory. Less than half of the member countries of the United Nations have ratified the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. Related protocols such as the protocol on liability and compensation are at the formulation stage. Similarly, only five countries have ratified the Bamako Convention on the Ban on the Import into Africa and the Control of Transboundary Movement of Hazardous Wastes within Africa.

10. Even though an increasing number of countries are establishing hazardous wastes treatment facilities, capacities in place in many countries are not sufficient to respond to current needs. Off-site recycling is widely used for waste minimization.

11. Ill-defined and ill-specified export of wastes apparently destined for recovery open the door to illegal traffic. Various reports emphasize the magnitude and seriousness of this problem. According to a recent report, the newly porous borders of the former Eastern bloc and developing countries have helped spur an often ugly world trading market in environmental waste. Economists, traders and multinational corporations see waste as an emerging global resource because it has value and can often be traded like a commodity. Indeed, businesses involved with the most fungible wastes such as paper, plastics and glass are already planning for formal commodity futures exchanges, similar to those that exist for oil, metals and agricultural products. The sums involved are enormous. The global waste management market in 1991 was worth more than $90 billion, about half of the value of world trade in metals and ores. Some forecasts estimate that waste management including hazardous wastes as a global business will be worth $500 billion or more by the year 2000.

12. Waste dumping cases in the newly opened countries of Eastern Europe and the former Soviet Union have run into the thousands over the last two years alone. Toxic chemicals and chemical wastes from Germany have turned up in Romania and Ukraine. Hazardous wastes have been found dumped in Albania, the Russian Federation, the Baltic republics, the Czech Republic, Hungary and Bulgaria.

13. The motive for such dumping stems from the rising cost of proper wastes disposal. Under American and European environmental laws, the cost of disposing of hazardous industrial and mining waste can reach as high as several thousand dollars per ton. Shipping such material abroad is often much cheaper. Furthermore, because of regulatory and political objections as well as public opinion in the developed countries, even waste incinerators and landfills boasting state-of-the-art technologies that reduce pollution to minuscule amounts compared with years past none the less take decades to build.

14. In the meantime, waste traders, seeing large-scale opportunities, propose to construct huge incinerators in poorer countries to which the traders would then ship large amounts of industrial wastes from the developed countries for burning. Traders promise to finance construction entirely with their own money and sometimes to provide cheap electricity generated from the waste fires as a bonus. 4/ These circumstances have already led to the adoption of a decision, at the recent second meeting of the Conference of Parties to the Basel Convention, to ban the transboundary movement of hazardous wastes completely (see para. 43).

15. Despite an increase in awareness of the need to adopt a preventive approach through cleaner production in order to achieve waste minimization, and more broadly, pollution prevention, efficient widespread use of cleaner technologies is inhibited by many factors, including inadequate government policies, limited capital for major investments and insufficient dissemination of information on commercially available forms of those technologies.

16. Similarly, very few countries have developed appropriate economic instruments and institutional arrangements for the implementation of hazardous wastes policies that could provide the necessary incentives to industry and consumers for a significant shift to cleaner processes and products.

II. REVIEW OF THE PROGRESS ACHIEVED IN PROGRAMME AREAS OF CHAPTER 20 OF AGENDA 21

A. International cooperation

17. In chapter 20 of Agenda 21, entitled "Promoting the prevention and minimization of hazardous wastes", the United Nations Conference on Environment and Development specified the following overall targets:

(a) Preventing or minimizing the generation of hazardous wastes as part of an overall integrated cleaner production approach; eliminating or reducing to a minimum transboundary movements of hazardous wastes, consistent with the environmentally sound and efficient management of those wastes; and ensuring that environmentally sound hazardous waste management options were pursued to the maximum extent possible within the country of origin (the self-sufficiency principle). The transboundary movements that took place should be on environmental and economic grounds and based upon agreements between the States concerned;

(b) Ratification of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal and the expeditious elaboration of related protocols, such as the protocol on liability and compensation, mechanisms and guidelines to facilitate the implementation of the Basel Convention;

(c) Ratification and full implementation by the countries concerned of the Bamako Convention on the Ban on the Import into Africa and the Control of Transboundary Movement of Hazardous Wastes within Africa and the expeditious elaboration of a protocol on liability and compensation;

(d) Elimination of the export of hazardous wastes to countries that, individually or through international agreements, prohibited the import of such wastes, such as the contracting parties to the Bamako Convention, the fourth Lomé Convention or other relevant conventions, where such prohibition was provided for.

18. In this context, the United Nations Conference on Environment and Development identified four programme areas for action at the national and international levels, namely, (a) promoting the prevention and minimization of hazardous wastes, (b) promoting and strengthening institutional capacities in hazardous waste management, (c) promoting and strengthening international cooperation in the management of transboundary movements of hazardous wastes, and (d) preventing illegal international traffic in hazardous wastes.

19. Unfortunately only a small number of reports have been submitted by Governments on progress made in the implementation of the programmes in chapter 20 of Agenda 21. However, the United Nations Environment Programme (UNEP), as task manager, submitted a comprehensive report on the activities of the United Nations system. Consequently, the main part of this section concentrates on United Nations activities in each programme area followed by a description of a few country experiences based on information available to the United Nations Secretariat at the time of the preparation of this report. A considered assessment of progress made can be attempted only as and when much more information is submitted on country experiences.

1. Programme area A: promoting the prevention and minimization of hazardous waste

20. The objectives of this programme area are to reduce the generation of hazardous wastes as part of an integrated cleaner production approach, to optimize the use of materials by recycling and to enhance knowledge and information on the economics of prevention and management of hazardous wastes.

21. The full implementation of this programme area lies primarily with industry and other hazardous waste generators, while Governments provide an enabling environment through their regulations and incentives for the prevention and minimization of hazardous wastes.

22. An increasing number of industries have started to implement cleaner production or pollution prevention and recycling programmes, through better

management practices, changes in the raw materials used and improved production processes. An increasing number of industry associations have adopted codes of conduct or of practice, such as the International Chamber of Commerce (ICC) Business Charter for Sustainable Development and the chemical industry's "responsible care", which includes specific references to pollution prevention and waste minimization.

23. Governments, mainly in developed countries, are beginning to adopt regulatory approaches promoting cleaner production and recycling, for example, through the establishment of clean environmental performance targets with flexibility regarding the means to meet those targets, and of reporting requirements for pollution and waste emissions.

24. However, many obstacles remain with respect to reaching the objectives of this programme. Countries undergoing rapid industrialization lack the regulatory framework and the subsequent enforcement systems that would compel industry to use cleaner production. Most developing countries lack capital for major cleaner production investments, even though they would have a good return on those investments. Industry in many countries, in particular small- and medium-sized enterprises, lacks the awareness, access to information, and expertise to implement cleaner production.

25. The United Nations system has oriented its activities towards promoting cleaner production and waste minimization as an effective way to solve hazardous waste problems.

26. UNEP has developed a comprehensive cleaner production programme in close cooperation with, in particular, the United Nations Industrial Development Organization (UNIDO), the International Maritime Organization (IMO) and the Organisation for Economic Cooperation and Development (OECD). In order to promote environmental management systems in industry, UNEP and UNIDO jointly published waste and emission auditing procedures in 1992, which are used in their training activities. Documents, presentations at international seminars and videos are just a few of the instruments used by the United Nations system to increase awareness on cleaner production and corresponding management tools, reporting and life-cycle analysis (see boxes 1 and 2). UNEP and ICC have set up an international advisory panel of top industry managers and government officials and non-governmental organizations to review progress in the implementation of the Business Charter for Sustainable Development.

27. UNEP and UNIDO have organized a number of training activities to support countries in building technical capabilities in cleaner production methods. UNEP and UNIDO are also working jointly on an initiative to establish a number of national cleaner production centres (NCPC) in developing countries. Those centres would play a coordinating and catalytic role in initiating cleaner production by giving technical information and advice, demonstrations of cleaner production techniques and technologies, and training of industry and government professionals in industrial environmental management. If funding becomes available, the first phase of this initiative will involve the establishment of seven centres during the period 1994-1996.

Box 1. United Nations publications relevant to hazardous wastes

Reports

Audit and reduction manual for industrial emissions and wastes (English, French, Chinese, Spanish), 1993, United Nations Environment Programme/United Nations Industrial Development Organization (UNEP/UNIDO)

Training manual on policies and strategies for hazardous waste (English, French, Spanish), 1993, UNEP with the Economic Commission for Latin America and the Caribbean (ECLAC)

Training manual on landfill of hazardous industrial wastes 1993, UNEP

Cleaner production worldwide, 1993, UNEP

Assessment of sources of air, water and land pollution, two volumes, 1993, the World Health Organization (WHO)

Managing medical waste in developing countries, 1994, WHO

Framework on the preparation of technical guidelines for the environmentally sound management of wastes subject to the Basel Convention; technical guidelines on hazardous waste from the production and use of organic solvents (Y6); technical guidelines on hazardous waste: waste oils from petroleum origins and sources (Y8); technical guidelines on wastes comprising or containing polychlorinated biphenyls (PCBs), polychlorinated terphenyls (PCTs) and polybrominated biphenyls (PBBs) (Y10); technical guidelines on wastes collected from households (Y46) (English, French, Spanish) adopted provisionally by the first meeting of the Conference of the Parties to the Basel Convention.

Periodicals

Cleaner Production Newsletter, UNEP, biannual

EnTA Environmental Technology Assessment, newsletter, UNEP, biannual

Managing Hazardous Wastes, newsletter (2 issues in 1992, 1 issue in 1993)

Nature and Environment Review, quarterly, UNEP (on managing contaminated land)

Box 2. Main meetings or workshops held by United Nations organizations since the United Nations Conference on Environment and Development

International

First meeting of the Conference of the Parties to the Basel Convention, Uruguay, 1992

UNEP ministerial meeting and senior-level seminar on cleaner production, France, 1992

Various meetings in the framework of the Basel Convention

Regional

UNEP workshop on landfill of hazardous waste, Jordan, 1992

International Labour Organization (ILO)/UNEP/WHO "train the trainer" workshop on environmental management in industry, Mauritius, 1993

Secretariat of the Basel Convention (SBC)/ECLAC workshop on hazardous waste management, Santiago, Chile, 1993

UN/Economic Commission for Europe (ECE) workshop on low and non-waste technologies, Warsaw, Poland, 1993

UNEP/WHO regional workshop on medical waste management, Dubai, United Arab Emirates, 1994

WHO/UNDP workshop on safe management of hazardous waste, Quezon City, Philippines, 1993

National

Various workshops involving UNEP, UNIDO, ILO, on cleaner production, including waste minimization, held in India (chemical industry, textile, tanneries), Thailand (textile, metal finishing), China (various industry sectors), United Republic of Tanzania, Tunisia, Mexico and Brazil

28. Site-specific demonstration activities to assess benefits and difficulties in implementing cleaner production have also been carried out, for example, in China jointly by UNEP and the World Bank; in Egypt, Senegal, and Zimbabwe by UNEP with the support of ICC and the Netherlands; and in Egypt and India by UNIDO (see box 3). UNEP together with the United Nations, the United Nations Conference on Trade and Development (UNCTAD) and other international and national organizations have launched the Environmental Technology Assessment (EnTA) activity as a tool to support the development and application of environmentally sound technology.

Box 3. Three examples of economic benefits from cleaner production

During the first phase of the UNEP/World Bank project, 67 low- and no-cost options implemented in seven plants for US$ 16,500 saved US$ 350,000 and reduced pollution load by more than 50 per cent.

As reported in Cleaner Production Worldwide, published by UNEP and the Government of the United Kingdom of Great Britain and Northern Ireland:

(a) An investment of US$ 180,000 in a metal-processing factory in Singapore brought a yearly saving of US$ 87,000, while reducing air emissions, and cyanide wastes, and improving the working environment;

(b) A textile plant in India stopped using highly polluting sodium sulphide in the dyeing process and substituted hydrol, which was a waste stream from the maize starch industry. This change required no capital expenditure, but brought an annual saving of US$ 3,000. The maize starch industry also benefited from this arrangement.

29. UNEP's report entitled "From regulation to industrial compliance" and associated training material and activities promote the integration of cleaner production approaches into the developing enforcement systems. Similarly, the secretariat of the Basel Convention (SBC) has disseminated draft model legislation on hazardous wastes which include elements of waste prevention and minimization.

30. Cost-benefit aspects of cleaner production are dealt with in the UNEP/UNIDO Waste Audit and Reduction Manual and in UNEP's International Cleaner Production Information Clearinghouse (ICPIC). ICPIC is expanding to include a database that features cleaner production case-studies (including costs-benefit elements), abstracts of cleaner production publications, information on events related to cleaner production and a message centre. The information is collected by international industry sector working groups on leather, textiles, metal finishing, mining, pulp and paper, cleaner products and biotechnologies, and by the countries themselves. A diskette version will soon be available to facilitate access to that information. This database is available for use by other United Nations organizations. It also supplements other organizations' databases, such as UNIDO's Industrial and Technological Information Bank (INTIB) and more specifically its Energy and Environment Information Systems (EEIS), aimed at providing information on environment issues to developing countries.

31. The monitoring of the hazardous waste situation, including waste minimization initiatives, is currently being carried out through the inter-agency Global Waste Survey and database coordinated by IMO in collaboration with UNEP, SBC, the World Health Organization (WHO), UNIDO, UNDP, the Food and Agriculture Organization of the United Nations (FAO), the World Bank, the Economic and Social Commission for Asia and the Pacific (ESCAP) and the Economic Commission for Europe (ECE). Over 100 countries participated in this survey. The results of phase one of the survey are available from IMO. It

gives an overview of the hazardous waste management situation in countries, but does not in fact contain detailed data or statistics on waste generation. The survey will be completed in late 1994 by which time the feasibility phase of the database will be transferred to UNEP (probably SBC) for updating, maintenance and wider inter-agency usage.

32. Reporting obligations for Parties under the Basel Convention include information on the development of technologies for the reduction of hazardous wastes. To date over 30 countries have prepared such reports. Strategy guidelines prepared by SBC in 1993 under the Basel Convention coordinate national activities. Coordination and monitoring of cleaner production activities are executed through biannual high-level meetings of government representatives, industry, and industrial organizations, who review the progress of the cleaner production programme. In this connection, in 1992 a ministerial and senior-level meeting was held and another one is planned for 1994. OECD and SBC have a memorandum of understanding confirming cooperation in data and information exchange relating to the implementation of the Basel Convention.

33. Results of research and development in cleaner production technologies are disseminated by the United Nations system during regular, ongoing meetings with Governments and industry. UNEP's technical guides and the World Bank/UNIDO/UNEP industry guidelines are used by United Nations system project managers. UNEP also promotes the development and use of environmental technology assessments and more research and development on life-cycle assessment. An international expert seminar on life-cycle assessment was held in the Netherlands and the results have been widely disseminated.

2. Programme area B: promoting and strengthening institutional capacities in hazardous waste management

34. The objectives of this programme area are to adopt appropriate coordinating, legislative and regulatory measures at the national level for the environmentally sound management of hazardous wastes, including the implementation of international and regional conventions; establish public awareness and information programmes on hazardous waste issues and to ensure that basic education and training programmes are provided for industry and government workers in all countries; establish comprehensive research programmes on hazardous wastes in countries; strengthen service industries to enable them to handle hazardous wastes, and to build up international networking; develop endogenous capacities in all developing countries to educate and train staff at all levels in environmentally sound hazardous waste handling and monitoring and in environmentally sound management; promote human exposure assessment with respect to hazardous waste sites and identify the remedial measures required; facilitate the assessment of impacts and risks of hazardous wastes on human health and the environment by establishing appropriate procedures, methodologies, criteria and/or effluent-related guidelines and standards; improve knowledge regarding the effects of hazardous wastes on human health and the environment; and make information available to Governments and to the general public on the effects of hazardous wastes, including infectious wastes, on human health and the environment.

35. There is world-wide awareness, catalysed by UNEP and SBC in cooperation with agencies, on hazardous waste issues and policies to address them. Regulations, mainly in developed countries, have been adopted to secure adequate treatment of hazardous waste. Treatment facilities, either on site or collective, are starting in developing countries.

36. However the situation is far from satisfactory. There is a lack of health surveys and epidemiological studies of the health impacts of hazardous waste mismanagement, as well as a lack of health impact assessments of existing hazardous waste treatment or disposal facilities. Enforcement of regulations, when they exist, is often insufficient. There is a lack of institutional capabilities in government to address this issue. Small- and medium-sized enterprises do not have the awareness or the possibility to develop their own treatment facilities. The capacity of adequate treatment facilities is insufficient to respond to current needs. As a result, uncontrolled disposal of wastes on land increasingly leads to soil contamination, which threatens surface and underground waters.

37. Examples of United Nations assistance to Governments that allow them to measure the extent of national hazardous waste problems include the Global Waste Survey, coordinated by IMO with the cooperation of SBC and UNEP, which will produce national waste inventories and inventories of disposal facilities. This Survey has provided national Governments with waste data-collection questionnaire forms to assist national investigations.

38. Training activities cover an array of aspects of waste management and involve several United Nations entities. Between 1987 and 1993, regional workshops on hazardous waste management policies treatment, disposal and minimization, organized by UNEP, were attended by 280 nationals from 85 countries. During 1993, several workshops were held by UNEP and SBC in the Latin American and Caribbean region, and the Asia and Pacific region on the implementation of the Basel Convention, and further work will be done with financial assistance from the European Union (EU). International training courses have also been held at national centres in Germany, Sweden and Thailand. WHO's Global Environmental Technology Network (GETNET) has training activities focused on occupational health assessments and control procedures. GETNET is also used as the infrastructure for an inter-agency collaboration between UNEP, WHO and ILO on "train-the-trainers" capacity-building with a focus on Africa.

39. Other aspects of this programme involve the establishment of regulatory frameworks and the dissemination of technical guidelines, exemplified by several International Labour Organization (ILO) conventions and its Recommendation concerning Safety in the Use of Chemicals at Work, as well as the dissemination of technical guidelines on the handling of specific waste types and wastes destined for recovery operations, the handling of hospital waste especially in developing countries, and the identification and remediation of contaminated sites. Within the United Nations system much of this work is produced by SBC, UNEP and WHO.

40. United Nations activities in the dissemination of health information, establishment of national health databases, and information on disposal operators include collection and dissemination, by UNEP as well as WHO and ILO

together through the International Programme on Chemical Safety (IPCS), of information on health aspects of chemicals and wastes as well as UNEP's technical publication on hazard identification in a local community, also applicable to waste disposal facilities. SBC also collects information, provided by Parties to the Basel Convention, on human health effects and disposal operations in addition to a current list of national authorities and focal points designated by Governments. UNEP publishes a directory of information sources on hazardous wastes, listing relevant national institutions nominated by national focal points, including a bibliography of important references.

41. With regard to hazardous waste treatment technologies, the United Nations system publishes information such as the World Bank/UNEP/WHO manual and the technical guidelines on waste treatment and disposal techniques (published by UNEP and SBC). The International Register of Potentially Toxic Chemicals (IRPTC) database also includes disposal methods for waste chemicals. The United Nations Educational, Scientific and Cultural Organization (UNESCO) has a programme on marine monitoring of chemical parameters commonly found in some industrial wastes, and sponsors symposia and training as well as on geochemical aspects of waste disposal and groundwater protection.

3. Programme area C: promoting and strengthening international cooperation in the management of transboundary movements of hazardous wastes

42. The objectives of this programme area are to: facilitate and strengthen international cooperation in the environmentally sound management of hazardous wastes, including control and monitoring of transboundary movements of such wastes, including wastes for recovery, by using internationally adopted criteria to identify and classify hazardous wastes and to harmonize relevant international legal instruments; adopt a ban on or prohibit, as appropriate, the export of hazardous wastes to countries that do not have the capacity to deal with those wastes in an environmentally sound way or that have banned the import of such wastes; and promote the development of control procedures for the transboundary movement of hazardous wastes destined for recovery operations under the Basel Convention that encourage environmentally and economically sound recycling options.

43. Since the United Nations Conference on Environment and Development, a number of steps have been taken by the international community towards implementing the objectives of this programme area. Notable achievements were the adoption, in 1992, of the waste nomenclature of the Basel Convention, and the adoption in 1992 by OECD countries of a decision concerning the control of transfrontier movements of wastes destined for recovery operations (including to non-OECD countries), which should shortly be effectively implemented by the European Union. At its second meeting, held from 21 to 25 March 1994, the Conference of Parties to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal adopted the following decision:

(a) To prohibit immediately all transboundary movements of hazardous wastes that were destined for final disposal from OECD to non-OECD States;

(b) To phase out by 31 December 1997, and prohibit as of that date, all transboundary movements of hazardous wastes that were destined for recycling or recovery operations from OECD to non-OECD States.

44. Activities by the international community in the area of strengthening and harmonizing criteria and regulations on waste and the implementing of existing agreements have included as regards the Basel Convention the production of manuals to facilitate its implementation. Cooperation between OECD, the European Commission (EC) and the Basel Convention secretariat has established notification and movement forms to satisfy simultaneously several international agreements on movement control, namely EC Regulation 259/93, OECD Council Decision C(92)39/FINAL and the Final Act (21 March 1989) of the Basel Convention. SBC and OECD are also cooperating closely on harmonizing aspects of the criteria for the definition of hazardous characteristics, inclusion of a number of wastes subject to the Basel Convention in the Harmonized System of the Customs Cooperation Council, and the formats of the notification and movement documents of the Basel Convention with that of the draft notification and tracking forms used and prepared by OECD.

45. Other OECD activities include review of testing procedures to characterize wastes, collection of data on transfrontier movement of hazardous waste, and the development of control systems for such movements when destined for recovery operations.

46. SBC assists developing countries in the implementation of the Convention through technical and legal advice, often through the provision of model legislation and training, and also through assistance in the prevention and management of hazardous wastes in the case of illegal traffic.

47. Model national legislation including an institutional framework has been prepared by SBC and provided to countries in order for them to deal adequately with transfrontier movement of waste. Training activities undertaken by UNEP and SBC contain an element dealing with transfrontier movement of wastes.

4. Programme area D: preventing illegal international traffic in hazardous wastes

48. The objectives of this programme area are to: reinforce national capacities to detect and halt any illegal attempt to introduce hazardous wastes into the territory of any State in contravention of national legislation and relevant international legal instruments; assist all countries, particularly developing countries, in obtaining all appropriate information concerning illegal traffic in hazardous wastes; and cooperate, within the framework of the Basel Convention, in assisting countries that suffer the consequences of illegal traffic.

49. Despite Conventions, recommendations and agreements in this area there is increasing evidence that ill-defined and/or ill-specified import and export of hazardous wastes destined for recovery can open the door to the illegal traffic of such wastes as indicated in section I of this report. The recent decision of

the Conference of Parties to the Basel Convention is an important step towards closing this door (see para. 43).

50. The United Nations system has concentrated its efforts in this programme area on training, information, and monitoring. Guidance documents on hazardous waste legislation and enforcement are published by UNEP and SBC, backed up by country-specific assistance in some cases. Joint programmes between UNEP and ESCAP have been set up as regards monitoring and reporting on illegal traffic in hazardous wastes in the Asia and Pacific region, but funding is sought for similar programmes in other regions. SBC is establishing a reporting system on illegal traffic as required by the Convention, while OECD has one already on legal traffic.

B. Some country experiences

51. In developing countries there is often a lack of institutions and infrastructures for dealing with hazardous wastes. Industries often go uncontrolled as to their toxic releases or waste disposal and there is little capacity to reuse or recycle wastes. Personnel is often untrained at both the industry and the government level for safe handling of wastes.

52. Legislation regarding waste management is gradually being introduced or updated in some countries. Screening of disposal, utilization or processing of wastes of foreign origin has been initiated in some cases. Recently, a proposal for generating electricity from polychlorinated biphenyl wastes from Japan was turned down in Myanmar. Capacity-building, training, regional and international cooperation and information exchange along with a strong coordinating body at the national level seem to have been common primary requirements by developing countries.

53. In developing countries undergoing rapid industrialization , hazardous waste management is one of the most challenging environmental concerns. Legislation as regards hazardous waste seems to be in place, and in some cases implementation of the Basel Convention and prior-informal-consent (PIC) is under way as well. In Malaysia, regulations dedicated to hazardous waste control have been in force since 1989 based on the cradle-to-grave concept. In the Republic of Korea, 38 per cent of hazardous waste is treated by the generator of that waste, while the rest is treated by private or public waste management companies licensed by the Government. In Tunisia, however, hazardous waste in many cases is just stored untreated at the site of generation or disposed of at municipal disposal sites. In other developing countries there is increasing concern as to the management of non-industrial hazardous waste, especially hospital waste.

54. In countries such as Myanmar, priority focus has been initiated in its petroleum industry because of the need to address the particular hazardous and toxic characteristics of the necessary chemicals, catalysts and additives. A similar strategy is being followed in Sri Lanka where industries generating particularly large quantities of hazardous wastes are being monitored by the Central Environmental Authority as to their compliance with domestic standards and plans are under way to relocate some industries such as tanneries to a common site having a central waste treatment plant. In Malaysia, working groups

have been formed to address the issue of the generating of hazardous waste by particular industries such as petroleum, asbestos, paints and electroplating.

55. Several developing countries emphasized a need for more information on innovative recycling, incineration and treatment technologies and methods because of the growing realization by concerned authorities of the grave threat of hazardous wastes to human health and the environment.

56. In general, newly industrialized developing countries have started to take steps to establish appropriate legislation, regulation and institutional structures in order to encourage cleaner production technologies, especially for new investments. Yet even these countries report on the need for improved measures for the transfer of appropriate technologies. Other developing countries emphasize the need for international assistance in all aspects of hazardous wastes management, especially in training and information exchange.

57. In the economies in transition management of hazardous wastes seems to be particularly problematic. In Hungary about 5 million tons of hazardous wastes are generated per year, of which 60 per cent is "red mud" from aluminium smelting. Half of the aluminium smelting waste is stored untreated at disposal sites or in transitional facilities. Waste management programmes planned during the mid-1980s for a network of regional hazardous waste landfills and incinerators failed to be completed because of financial constraints associated with the collapse of previous political and economic regimes, and only half of the planned installations are now in operation. Appropriate governmental regulations seem to be in place as regards both handling and import/export, and in some case these are harmonized with the Basel Convention, PIC and EU. However lack of resources hinders implementation. International and regional cooperation in this area is of increasing importance. Strategies for hazardous wastes management have been developed, for example, by Poland and Hungary Action on Reconstruction of Economies (PHARE). In Estonia, fairly recent legislation regulates waste management, and it is, to the extent possible, in line with international conventions and agreements. Enforcement is constrained by lack of specialized treatment facilities, lack of knowledge and trained personnel and other fundamental problems related to land and property reforms and the contamination of former military sites.

58. In some Western European countries such as the Netherlands and the United Kingdom of Great Britain and Northern Ireland, there is active involvement in the formulation of EU policies and directives as regards the management and prevention of hazardous wastes. More countries are also considering stricter regulations in the export of wastes for recycling, where this is still permitted by the Basel Convention. Countries involved in the North Sea Ministers' Conference are introducing limitations to releases of hazardous substances into the North Sea. In the United Kingdom it has been estimated that some 100,000-200,000 hectares of land are contaminated by industrial processes, and there is now a review of the liability, as well as the scientific and technological issues, involved in land restoration. The Government of the United Kingdom is also involved in formulating policies to reduce agricultural waste and the use of pesticides. In that country, major industrial processes are required by law to employ the best practicable environmental option under integrated pollution control. The United Kingdom is of the same opinion as many

other industrial countries that cleaner production methods are much more efficient as a pollution prevention approach than end-of-pipe solutions, often resulting in less waste as well. The United Kingdom takes care of its own wastes and is reducing imports from other developed countries. Waste destined for recovery, mostly among OECD countries, can be a valuable alternative to the use of raw materials and the United Kingdom would like to see such shipments continue provided that the waste is handled responsibly and in an environmentally sound manner.

59. In the United States of America, the principal federal laws regulating hazardous wastes are the Resources Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), also known as the Superfund Act. The former is a nationwide programme designed to protect human health and the environment from the risks of improper management of hazardous and solid wastes, providing a cradle-to-grave system of regulations administered by state governments with federal supervision. The latter, which is not delegated to state level, was designed to prompt clean-up of sites and other areas where past disposal posed a threat to the environment and human health. The United States is currently developing legislation necessary for the ratification of the Basel Convention. The United States has numerous programmes addressing all aspects of hazardous waste management and minimization. Waste minimization's being of the highest priority has led the Environmental Protection Agency (EPA) to issue guidelines for waste reduction programmes requiring generators to make their waste reduction programmes available to the public, to develop strategies to strengthen technical control over incinerators and increase public participation in the permitting process, and to evaluate existing regulation with a view to seeing its effect on recycling efforts. Activities related to innovative technology development are under the purview of several federal agencies. For example, EPA has the Technology Innovation Office and the Superfund Innovative Technology Evaluation Programme.

60. Twenty years of attempting to regulate hazardous wastes in the United States has led to a realization of the critical importance of preventing pollution rather than controlling the impact of those wastes on the environment. Wastes will always have to be regulated but programmes reducing their creation at the source have tended to be more effective both as regards the environment and economics. The United States has also found that public participation in decision-making processes involving the management of hazardous and solid wastes solves many of the difficult issues that are involved. The United States has had widely reported difficulties with its Superfund. The cost and pace of clean-up activities have been larger and slower than anticipated. This programme has also resulted in very large so-called transaction costs, basically involving legal fees. The Government has carried out an evaluation of the Superfund in anticipation of its reauthorization in 1994, with the goals of enhancing enforcement fairness, reducing transaction costs, and enhancing clean-up effectiveness and consistency, public involvement and the role of the States.

61. Canada has also embraced a similar policy direction to that of the United States, namely one of prevention rather than cure when it comes to hazardous wastes. This has inv lved voluntary programmes by industry, government legislation and economic incentives. The Hazardous Waste Minimization

Committee, established by industry, and involving Governments, environmental groups and labour, is a part of this voluntary approach. Canada has set a target to reduce the amount of hazardous waste destined for final disposal by 50 per cent of its 1990 level by the year 2000.

62. In 1993, the Canadian Council of Ministers of the Environment (CCME) re-established the Hazardous Waste Task Force in order to achieve uniform management of hazardous waste across Canada. Part of this effort is a comprehensive national inventory of hazardous waste and a catalogue of waste facilities. Canada has North America's first fully integrated hazardous waste treatment plant, namely the Alberta Special Waste Treatment System. This is jointly owned by the Alberta Government and a private enterprise and includes transfer stations, transportation systems and the treatment plant. Otherwise there are active programmes involving waste minimization, reuse and recycling in other provinces. The Governments of Canada and the United States have initiated regional cooperation in order to better understand the transboundary movement of hazardous waste between the western parts of their countries. Canada has fairly recently upgraded legislation in order to ratify the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal as well as OECD decisions on wastes for recovery.

C. Technology and finance

1. Technology 5/

63. Three different aspects of hazardous waste technologies require consideration, namely treatment, clean-up technologies for existing contaminated sites and cleaner production technologies for hazardous wastes minimization and prevention in new investments. However, particular efforts to achieve new solutions should be made in the last two fields.

64. As pointed in section I of this report there is already a substantial waste management industry in the developed countries which is expected to grow considerably in the medium-term future. The growth of this industry has been promoted by national legislation requiring higher standards in treatment and disposal as well as clean-up of hazardous wastes sites. Financing for these purposes has been provided by new instruments such as the Superfund of the United States with contributions from both government and the private sector as well as funding from state and local authorities. The development of cleaner production technologies has been prompted by actual or feared liability in the generation of hazardous wastes by existing technologies and general technological advance. All three technology aspects of this industry are growing rapidly with consequences for information exchange and transfer of technologies issues.

65. In general there has a been growing exchange of information and experiences since the United Nations Conference on Environment and Development. UNEP's International Cleaner Production Information Clearinghouse has been developed and is increasingly in demand. However, the task of collecting, assessing and disseminating this kind of information to users is large and requires more funding. The establishment of clearing-houses that disseminate information is

seldom carried out by the private sector, even though private enterprises often contribute by providing free information on cleaner production technologies and management practices. Funding, therefore, must generally be provided by the public sector.

66. There are some examples of incentives created to increase the momentum of the introduction of new technologies in this area. The United States Environmental Protection Agency has put forward a proposal replacing incineration as a Best Demonstrated Available Technology (BDAT), with alternatives for many land-banned wastes, such as recycling and waste-minimization technologies. The air pollution industry is consequently moving away from end-of-pipe solutions to technologies preventing pollution in industrial processes because of these other kinds of incentives and regulations.

67. Given the numerous problems connected with the traditional incineration of hazardous wastes, such as release of toxic substances up the smokestack, new ways are being sought to handle the clean-up of hazardous wastes. Box 4 presents one example.

Box 4. One new way to clean up hazardous wastes

An American company has developed a technology that has had some very favourable responses, involving the immersion of wastes and toxic chemicals in metal at 1,760 degrees Centigrade (3,200 degrees Fahrenheit) where they then break down into their constituent elements because of the heat and catalytic effect of the metal. Hydrocarbons break down into hydrogen, which goes off at the top, and carbon, which boils off as carbon dioxide if oxygen is provided. Valuable materials in the resulting metal alloy can be recovered eventually. The leftover slag, which would include chlorine, could be made into abrasive or processed further. The company has recently announced an agreement with another American company to build the first commercial plant using this technology at the United States Department of Energy's Oak Ridge facility. The plant will be handling Department of Energy waste-first hazardous wastes, but there are long-term possibilities of the handling also of radioactive wastes. The plant will process 10,000 tons of waste per year (cost US$ 20-25 million); funding will be provided by the United States Department of Energy, and it is expected that the plant will be operational by late 1995. Watery wastes are not suitable for this technology because of the additional energy requirements of heating up the water. This technology would be attractive to companies since with such technology on site they would be able to classify their waste as process intermediates and thus evade costly regulations and long-term liability.

Sources: John Holusha, "No-smoke ways to burn wastes", New York Times, Wednesday, 16 June 1993; and "Waste management: hot solution", The Economist, 10 July 1993.

68. The introduction of cleaner production technologies are more difficult to assess. In most countries there is, however, a tendency for new investments in capital stock to be "cleaner" than the older ones especially if there is a high cost attached to handling any resulting toxic releases and wastes from a given process.

69. A growing number of successful partnerships is being developed at bilateral and multilateral levels involving Governments and, increasingly, the private sector. UNEP is publishing jointly with the Prince of Wales Business Forum and Tufts University a booklet on such successful partnerships involving industry. One example is presented in box 5.

Box 5. A successful partnership

For many years, all major electronic suppliers had been chlorofluorocarbon-13 (CFC-13) as a cleaning solvent to remove soldering residue from circuit boards in the cleaning process. In response to the Montreal Protocol on Substances that Deplete the Ozone Layer, one of the world's largest telecommunications companies decided to implement alternatives. To extend its elimination programme and share its success, this company formed partnerships with other stake holders in further projects to assist in ozone layer protection. One such partnership was with the Industry Cooperative for Ozone Layer Protection (ICOLP), a Washington, D.C.-based association of 17 multinational corporations, Governments and industry associations from the United States, Sweden, the former Soviet Union, Mexico and Japan.

Mexico was the first country to sign the Montreal Protocol. It was also the first developing country to commit to eliminating CFC solvents 10 years earlier, then mandated for developing countries by the Montreal Protocol. Mexico continues to play a leadership role through its partnership with this large company of Canada and the Environmental Protection Agency (EPA) of the United States in a project to eliminate ozone-depleting solvents from Mexican industry. Experts from ICOLP held workshops throughout Mexico to introduce alternative technologies. In cooperation with the Mexican Environment Ministry (SEDUE), EPA and the company created a project for technology cooperation: SEDUE provided intersectoral consultation and facilitated investments in environmentally sound technologies; EPA provided support in the development of environmental control procedures; and the company shared its experience in implementing processes and technologies, managed the series of workshops and coordinated the input of experts from other companies.

2. Finance 6/

Programme area A

70. Agenda 21 has estimated the total annual cost of implementing the activities of this programme areas at US$ 750 million coming from the international community on grants or concessional terms. This estimate was based on a target of establishing and operating national training centres and projects in 60 developing countries.

71. To date no centres have been established. There has been agreement to launch feasibility studies for the establishment of one centre in Africa (possibly in Nigeria), one in Latin America (possibly in Argentina or El Salvador) and one in China. One developed country has expressed interest in funding the feasibility study for the centre in Latin America. The Basel Convention secretariat also undertook an exploratory mission to China in 1993 to explore the possibility of a feasibility study forums centre in China, provided funds are made available to SBC. In sum, there had been no actual funding allocated to the establishment of centres by the time this report was being written.

72. There is limited dispersed information on the financing of and budgets on hazardous waste minimization by each United Nations organization. Available on United Nations system expenditures includes the following:

(a) The UNEP cleaner production programme budget amounted to US$ 800,000 in 1993, mainly from the environmental fund. In addition, total contributions of US$ 430,000 were brought by Denmark, the Netherlands, France, the European Union and the United States. In-kind support of US$ 250,000 was brought by the United States (secondment of one senior-level staff and support to the development of the database), the United Kingdom (funding of a publication), Norway and the Netherlands (funding of consultants), Denmark (secondment of one consultant), and Australia (sponsoring of a working group and international conferences). This represents an increase from 1990, even if it is still insufficient in view of the needs;

(b) UNIDO's cleaner production activities amounted approximately to more than US$ 2 million in 1993. The Netherlands is providing US$ 1.8 million and Denmark is expected to provide the same amount in 1994;

(c) The SBC total budget in 1993 was US$ 2,263,000, of which US$ 1,474,650 were allocated to the Trust Fund for the implementation of the Basel Convention and US$ 88,740 were allocated to the Technical Cooperation Trust Fund to assist developing country members in the implementation of the Basel Convention.

Programme area B

73. At the United Nations Conference on Environment and Development, it was estimated that the annual cost for this programme area would be US$ 18.5 billion including US$3.5 billion for developing countries, of which US$ 500 million would come from the international community.

74. There is no comprehensive estimate of expenditures for this purpose in either the developed or the developing countries. Some identifiable expenditures by the United Nations system in this programme are as follows:

(a) The SBC budget for 1993 was US$ 2,263,390, of which $1,474,650 were allocated to the Trust Fund for the implementation of the Basel Convention and $788,740 were allocated to the Technical Cooperation Trust Fund to assist developing country members in the implementation of the Basel Convention;

(b) During 1992/93, WHO spent around US$ 100,000 from its regular budget and US$ 100,000 from extrabudgetary funds in activities related to hazardous wastes, especially medical waste, including interregional and regional meetings, documents preparation and consultantships in members countries;

(c) The Global Environment Facility (GEF) has funded three projects dealing with treatment of ship wastes in China, the Mediterranean and the Caribbean for a total of US$ 45 million.

Programme area C

75. It was felt at the United Nations Conference on Environment and Development that this programme area covered a relatively new field and no cost estimate was presented at that time. The United Nations Conference on Environment and Development, however, requested SBC to present cost estimates at the second meeting of the Parties to the Basel Convention to be held in March 1994. The Open-ended Ad Hoc Committee for the Implementation of the Basel Convention did not endorse this proposal.

76. Agenda 21 highlights capacity-building to deal with transfrontier movement of wastes, and the United Nations system and SBC have undertaken several activities.

77. Training activities undertaken by UNEP and SBC contain an element dealing with transfrontier movement of wastes. The Parties to the Basel Convention requested SBC to organize national and regional workshops and training programmes on the implementation of the Convention and Agenda 21 chapter 20 objectives. A trust fund for technical cooperation was set up to assist developing country Parties in the implementation of the Convention to which Parties were invited to contribute. Of seven planned workshops for 1993, at a total cost of US$ 275,000, only one was held, in Santiago, Chile, because of a lack of financial contributions.

78. This funding mechanism, namely, assessed contributions to the core SBC trust fund and voluntary contributions to the technical cooperation trust fund, is clearly inadequate. It does not provide the required stability for planning and implementing activities on a continuous basis involving the largest possible number of Contracting Parties.

Programme area D

79. No cost estimate was prepared at the United Nations Conference on Environment and Development for this programme area. All activities in this area were, or have been, undertaken within existing resources available to SBC (see box 6).

Box 6. Funding through and of the secretariat of the Basel Convention (SBC)

In accordance with decision I/7 on Institutional and Financial Arrangements, adopted by the Parties in December 1992, two trust funds were established, namely, the Trust Fund for the Basel Convention, with a budget for the implementation of the Convention estimated at US$ 1.47 million in 1993; and the Technical Cooperation Trust Fund to help countries in need of assistance to implement the Convention, with a budget of approximately US$ 790,000 for 1993. Parties and non-parties were requested to make their voluntary contributions to the Technical Cooperation Trust Fund.

The total budget estimated for 1993 to enable SBC to undertake all activities envisaged by the Convention was the sum of the amounts earmarked in the trust funds, namely, US$ 2.26 million. Contributions by Parties being delayed, UNEP has been obliged to provide SBC with reserve funds on a reimbursable basis. Not counting costs related to the approved staff table of SBC, it has disbursed a total of only US$ 629,000 in 1993 in all activities. These activities cover only the current 62 parties to the Convention and overlap only in part with activities proposed in Agenda 21. Neither SBC nor any of the other international organizations mentioned above have at present specific provisions in their budgets for the implementation of Agenda 21 chapter 20 activities.

III. CONCLUSIONS AND PROPOSALS FOR ACTION

A. Conclusions

80. The rapid evolution in environmental thinking in recent times has brought waste management and waste prevention closer together. Waste minimization through a cleaner production approach, aimed at preventing emissions and waste waters and efficient use of energy and other natural resources, is now understood as being fundamental to comprehensive waste management strategies. However, the translation of this public consensus into viable investments will require a variety of measures that will involve the accelerated application of available cleaner technologies and the development of new techniques through a strengthening of research and development programmes, especially by the private sector.

81. At present, the development and use of cleaner technologies is insufficient to meet the cleaner production challenge. Furthermore, the private sector is not closely associated with the development and implementation of hazardous waste management policies and small- and medium-sized enterprises do not have

the necessary environmental awareness or the expertise and financial resources to deal with the hazardous waste issue.

82. Government legislation and regulations are required, especially in developing countries and the economies in transition. The impact of such instruments, however, will remain limited in the face of the absence or inadequacy of trained personnel and institutional structures, as well as the political will to enforce regulations.

83. Data and statistics on waste production, which are necessary for waste management strategies and activities and for monitoring achievements and overall management, are often fragmentary and unreliable, especially in developing countries.

84. Ill-defined or ill-specified recycling activities often open the door to illegal traffic in wastes, especially because of powerful financial incentives provided by the high costs of recycling in developed countries and corresponding opportunities in developing countries where such activities often lead to adverse health and environmental effects and little financial benefit.

85. The clean-up task of existing hazardous waste sites in both developed and developing countries as well as the economies in transition remain a formidable challenge which will require enormous financial resources, the more widespread application of existing clean-up technologies and the development of new methods and techniques.

86. In the United Nations system there has been a notable shift from policy development to capacity-building, with greater inter-agency cooperation. In view of the strong priority given to cleaner production and prevention approaches throughout Agenda 21, the United Nations system is increasingly emphasizing this approach in agendas for meetings and training programmes.

87. In banning ocean dumping of hazardous waste, effective 1 January 1996, IMO and the Contracting Parties to the London Convention of 1972 have also called for increased emphasis on minimization and recycling of all waste. Both UNIDO and UNEP have joined with the World Bank in order to incorporate cleaner production concepts into the forthcoming industrial guideline series which will cover over 80 industrial sectors. Greater efforts are being made to promote environmentally sound recycling of hazardous waste.

88. UNEP and SBC have now begun to concentrate on providing support to countries to implement policy and technical guidelines for hazardous waste management.

89. There is also an apparent improvement in the partnership among the various shareholders: Governments, industry, non-governmental organizations and international organizations. The various United Nations organizations, and particularly UNEP and SBC, are providing a neutral forum to discuss solutions with regard to handling the hazardous waste issue, as well as other environmental management issues in industry, to improve technology transfer and to periodically review progress as well as problems yet to be solved. The UNEP/ICC high-level panel to review progress in the implementation of the

Business Charter for Sustainable Development provides a good example of such a partnership.

B. Proposals for action

90. Even though some progress has been made, much remains to be done in order to achieve Agenda 21 objectives. The following points highlight some of the main actions required to overcome constraints and obstacles.

91. Institutional:

(a) Enforcement capabilities of regulations, when they exist, have to be strengthened;

(b) The private sector has to be more closely associated with the development and implementation of hazardous waste management policies. Small- and medium-sized enterprises currently do not have the necessary environmental awareness and the expertise and financial resources to deal with the hazardous waste issue;

(c) Ill-defined or ill-specified recycling activities open the door to the illegal traffic of waste. Loopholes in existing conventions, agreements and recommendations have to be closed. A big step in that direction was the recent decision taken at the second meeting of the Conference of Parties to the Basel Convention (see para. 43);

(d) Data and statistics on waste production, particularly in developing countries will be vital for hazardous waste management strategies and activities, and for monitoring achievements and overall hazardous waste management. The United Nations system has started work in this area through the Global Waste Survey. It is already clear that waste generation surveys will always be difficult and costly to conduct because of the complexity of waste composition and testing procedures. Harmonized methodologies and nomenclature, in addition to cost reductions, should be sought in this area. OECD's quality improvements in their waste import/export data could serve as a good example.

92. Technical:

(a) More attention has to be paid to the production of hazardous wastes from sources other than industry, such as agriculture, hospitals, and the domestic sector, and other discarded products that contain hazardous substances;

(b) More effort has to be directed towards the development and demonstration of cleaner technologies in order to meet the cleaner production challenge through their wide application in all countries;

(c) Exchange of information on cleaner production experiences and training has to be strengthened;

(d) Examinations of the full dimension of soil and water contamination, due to improper disposal of hazardous wastes as well as improper use of

pesticides and fertilizers or air pollutants particularly in developing countries, have to be stepped up as in some cases these acts might be environmental emergencies waiting to happen.

93. Economic:

(a) Capital investments are required for instituting cleaner production processes resulting in cost-effective production often with short payback periods;

(b) Governments should develop economics instruments to complement their hazardous waste legislation in order to provide the necessary incentives for industry and consumers to shift towards cleaner processes and products.

Notes

1/ Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992, vol. I, Resolutions adopted by the Conference (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

2/ See Official Records of the Economic and Social Council, 1993, Supplement No. 5A (E/1993/25/Add.1), chap. I, para. 28.

3/ Ibid., para. 24.

4/ Steve Call, "Global economy faces the global dump", International Herald Tribune, 24 March 1994.

5/ This subsection is based in part on a report distributed to the Commission on Sustainable Development's Inter-sessional Ad Hoc Open-ended Working Group on Technology Transfer and Cooperation (which met from 23 to 25 February 1994), entitled "UNEP input to the report of the Department of Policy Coordination and Sustainable Development of the United Nations Secretariat on chapter 34 of Agenda 21 ("Transfer of environmentally sound technology, cooperation and capacity-building"): the case of technology transfer for hazardous waste management".

6/ The information in this subsection is partly based on background paper, No. 4, entitled "Financing of hazardous wastes for sustainable development", which was available to the Commission on Sustainable Development's Inter-sessional Ad Hoc Open-ended Working Group on Finance (which met in New York from 28 February to 3 March 1994).